

REMARKS

In response to the Office Action mailed March 21, 2007, Applicants have amended claims 1, 13, 17, and 27. No new claims have been added and no claims have been canceled. Accordingly, claims 1-4, 6-15, 17-25, 27-28, 30-31, 33-49, 52, and 54-63 are pending, with claims 1, 13, 17, and 52 in independent form.

Applicants thank the Examiner for his indication that claims 8, 36, and 37 would be allowable if rewritten in independent form, and agree that these claims are patentable over the prior art of record. Applicants have elected not to rewrite these claims in independent form at the present time, but reserve the right to do so in future.

Claim 27 stands objected to by the Examiner due to a typographical error. Applicants have amended claim 27 to remove the error, and therefore request withdrawal of the Examiner's objection.

Claims 1-2, 6-7, 9, 12, 15, 17-18, 27-28, 30-31, 33-35, 38, 43-46, 52, 55-58, and 60-63 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Carey et al. (U.S. Patent No. 6,274,924, "Carey"). Independent claims 1 and 17 have been amended to cover leadframes and housings that include "a separately manufactured thermal connecting part disposed in [an] opening and fastened into [a] mount part to form an electrical connection with the at least one external electrical connecting strip." The amendments to claims 1 and 17 are supported by the original application at, for example, page 3, lines 1-19. Independent claim 52 recites "a separately manufactured thermal connecting part disposed in the opening of the mounting region and secured to the mounting region to form an electrical connection with the first electrically conductive component." Carey does not disclose or suggest a thermal connecting part that forms an electrical connection to an external electrical strip or component.

Carey discloses LED packages that include a "heat-sinking slug 10" (Carey, col. 2, line 22) and a "light-emitting diode (LED) die 16 [that] is mounted directly or indirectly via a thermally conducting sub-mount 18 to the slug 10" (id., lines 26-28). However, Carey does not disclose that slug 10 forms an electrical connection with an external electrical connector. To the contrary, Carey states that "metal leads on leadframe 12 ... are electrically and thermally isolated

from the slug 10" (id., lines 29-31, emphasis added). That is, Carey's heat-sinking slug, which corresponds most closely with the thermal connecting part of claims 1, 17, and 52, is explicitly not electrically connected to the leadframe. In contrast, each of claims 1, 17, and 52 requires a thermal connecting part that "form[s] an electrical connection" with an electrical connecting strip or component.

Moreover, there is no reason to modify Carey's disclosure to provide an electrical connection between slug 10 and leadframe 12. In fact, Carey teaches away from such an electrical connection, stating that "prior art packages lack thermal isolation between the electrical and thermal paths ... [and as] a result, the packaged die are subject to thermal stresses from the temperature cycling" (id., col. 1, lines 30-33). Based on Carey's disclosure, one of skill in the art at the time of the invention would therefore have found no reason to modify Carey to provide a mount part that "form[s] an electrical connection" to an external electrical connecting strip or component, as required by claims 1, 17, and 52.

Accordingly, Applicants submit that claims 1, 17, and 52 are patentable over Carey, and respectfully request withdrawal of the Examiner's rejection of these claims under 35 U.S.C. § 102(b). Each of claims 2, 6-7, 9, 12, 15, 18, 27-28, 30-31, 33-35, 38, 43-46, 55-58, and 60-63 depends from one of claims 1, 17, or 52, and is therefore patentable for at least the same reasons.

In addition, Applicants specifically wish to address the rejection of claims 6 and 7. Claim 6 covers leadframes in which the wire connecting area "is disposed at a higher level than said chip mounting area as viewed from said chip mounting area." The Examiner alleges that "Carey et al. teaches in column 2, lines 26-31 the bond wires extend from the LED 16 and the surmount 18 to metal leads on lead frame ... [a]s such, the wire connecting area must be disposed at a higher level than the chip mounting area as viewed from the chip mounting area" (Action at page 3). Applicants traverse, and can find no basis in Carey for the Examiner's unsubstantiated inference.

To the contrary, based on Figure 2 of Carey, it is not at all clear that the wire connecting area, which corresponds to a portion of leadframe 12, must be disposed at a higher level than the chip mounting area (e.g., the upper surface of sub-mount 18). Carey is silent with regard to the

relationship between the wire connecting area and the chip mounting area, and he does not disclose or even acknowledge any advantage to the claimed relationship between the wire connecting area and the chip mounting area. Therefore, in the absence of any positive disclosure in Carey, it cannot be fairly stated that Carey anticipates the subject matter of claim 6.

Claim 7 covers leadframes in which the reflector well has an edge, and the "wire connecting area is disposed above said edge as viewed from said chip mounting area." The Examiner alleges that "Carey et al. discloses in figure 2 the reflector well 14 has an edge ... and the wire connecting area must be disposed above the edge as viewed from the chip mounting area" (Action at page 3). Applicant traverses, and can find no basis in Carey for the Examiner's statement.

To the contrary, Figure 2 of Carey shows the relationship between leadframe 12 – which corresponds to the wire connecting area – and the edge of reflector well 14. Contrary to the Examiner's assertion, it appears from Figure 2 of Carey that the wire connecting area is disposed below the edge of reflector well 14, not above the edge of the reflector well as recited in claim 7. Applicants can find no disclosure or suggestion in Carey of a wire connecting area disposed above the edge of a reflector well, as required by claim 7. Accordingly, Applicants submit that claim 7 is not anticipated by Carey as alleged by the Examiner.

Therefore, for each of the foregoing reasons, Applicants respectfully request withdrawal of the rejection of claims 2, 6-7, 9, 12, 15, 18, 27-28, 30-31, 33-35, 38, 43-46, 55-58, and 60-63 under 35 U.S.C. § 102(b).

Claims 3-4 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Carey in view of Barnett et al. (U.S. Patent No. 6,903,380, "Barnett"). The Examiner admits that Carey fails to disclose a thermal connecting part and a mount part connected via welding, but alleges that "Barnett et al. discloses in figure 2 the thermal connecting part 14 and the mount part 54 being connected by welding (col. 9, lines 62-65)" (Action at page 8). The Examiner further alleges that "it would have been obvious ... to modify Carey et al. by having the thermal connecting part and the mount part being connected by welding to effectively provide an electrical connection" (Action at page 8).

Applicants traverse. Claims 3 and 4 depend from claim 1 and cover leadframes in which a thermal connecting part and a mount part are connected by “at least one of a crimped connection, a riveted connection, a soldered connection, and a welded connection.” Applicants agree that Carey does not disclose such connections between a thermal connecting part and a mount part. In addition, it would not have been obvious to modify Carey according to the teaching of Barnett to provide the claimed connections.

As discussed above in connection with claim 1, Carey specifically teaches away from a LED package that includes a connection between a thermal connecting part and a mount part. Carey states that “prior art packages lack thermal isolation between the electrical and thermal paths ... [and as] a result, the packaged die are subject to thermal stresses from the temperature cycling” (Carey, col. 1, lines 30-33). Carey further states that “accumulated mechanical stresses reduce the overall LED reliability” (id., lines 43-45).

Based on Carey's disclosure, one of skill in the art at the time of the invention would therefore have found no reason to modify Carey to provide a “laser welded or otherwise mechanically coupled” (Barnett, col. 9, lines 64-65) connection between slug 10 and leadframe 12. To the contrary, Carey's disclosure would have suggested that it is important to maintain electrical isolation between slug 10 and leadframe 12. Thus, one of skill in the art would not have combined Carey and Barnett in the manner proposed by the Examiner.

Applicants submit that claims 3 and 4 are patentable over both Carey and Barnett. Accordingly, withdrawal of the rejection of claims 3 and 4 under 35 U.S.C. § 103(a) is respectfully requested.

Claims 10-11 and 19-25 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Carey in view of Waitl et al. (U.S. Patent No. 6,624,491, “Waitl”). Claims 10 and 11 depend from claim 1, and claims 19-25 depend from claim 17. As discussed above, claims 1 and 17 are patentable over Carey because there is no disclosure or suggestion in Carey to provide a mount part that “form[s] an electrical connection” to an external electrical connecting strip or component, as required by claims 1 and 17.

Waitl does not cure Carey's deficiencies with regard to claims 1 and 17. Waitl discloses a diode housing in which "a contact metallization 18 bonds a first surface" (Waitl, col. 4, lines 61-62) of a LED chip to an external electrode 4. However, as discussed above, Carey specifically teaches away from providing an electrical connection between a thermal connecting part and a mount part. Thus, one of skill in the art would have found no reason to modify Carey according to the teaching of Waitl to provide the subject matter of claims 1 and 17.

Accordingly, Applicants submit that claims 1 and 17 are patentable over both Carey and Waitl. Claims 10-11 and 19-25, each of which depend from one of claims 1 and 17, are therefore patentable for at least the same reasons.

Applicants also wish to specifically address the rejection of claims 22, 24, and 25. Claim 22 covers housings that include "a reflector well forming a first part of a reflector" and "side walls of [a] radiation outlet window form[ing] a second part of said reflector ... and said well merges to said second part." The Examiner alleges that "said thermal connecting part 20 has a reflector well 30 forming a first part of a reflector (figure 1 of Minoru); said sidewalls of the radiation outlet window 10 form a second part of the reflector (figure 1 of Waitl et al.); and said well 30 merges to the second part 12" (Action at page 9). Applicants traverse, for the following reasons.

First, the Examiner's reference to Minoru in the context of the present Office Action is improper. To the best of Applicants' knowledge, Minoru is not applied as a prior art reference in the present Action. Accordingly, the rejection of claim 22 should be withdrawn.

Second, it is not at all clear how the Examiner proposes to combine Carey and Waitl to yield the housings covered by claim 22. Carey discloses (e.g., see Figure 2 of Carey) a reflector well 14 with vertical sides. Waitl discloses (e.g., see Figures 1 and 3 of Waitl) a reflector well with angled sides. Neither Carey nor Waitl discloses or suggests "a reflector well forming a first part of a reflector" and "side walls of [a] radiation outlet window form[ing] a second part of said reflector ... and said well merges to said second part" as required by claim 22, and the Examiner provides no indication of how Carey and Waitl can be combined to yield the claimed housings.

In fact, the rejection of claim 22 is a hindsight reconstruction, using claim 22 as a template to reconstruct the invention by picking and choosing isolated disclosures from the prior art. This is impermissible under the law. For example, in *In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992), the Federal Circuit stated:

It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. *In re Gorman*, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." (quoting *In re Fine*, 837 F.2d at 1075, 5 USPQ2d at 1600)

The present rejection of claim 22 fits the court's description of what may not be done under § 103. The Examiner has merely listed certain features of Applicant's invention and then located isolated disclosures of certain components that may or may not correspond to the claimed features, without indicating how or why the components would be combined. The law requires more than that.

Claim 24 covers housings where the chip has a main emission direction, the "reflector well has reflector walls," the "radiation outlet window has reflector surfaces," and the "reflector walls and ... reflector surfaces are at different angles with respect to the main emission direction." The Examiner alleges that "the combination of Carey et al. and Waitl et al. discloses the chip 40 has a main emission direction; said reflector well 30 has reflector walls (figure 1 of Minoru); said radiation outlet window 10 has reflector surfaces 12 (figure 1 of Waitl et al.); and said reflector walls and the reflector surfaces are at different angles with respect to the main emission direction" (Action at page 10). Applicants traverse, for the following reasons.

First, the Examiner's reference to Minoru in the context of the present Office Action is improper. To the best of Applicants' knowledge, Minoru is not applied as a prior art reference in the present Action. Accordingly, the rejection of claim 24 should be withdrawn.

Second, it is not at all clear how the Examiner proposes to combine Carey and Waitl to yield the housings covered by claim 24. Neither Carey nor Waitl discloses or suggests reflector

walls and reflector surfaces that “are at different angles with respect to the main emission direction” as required by claim 24. Furthermore, the Examiner provides no indication of how or for what reason the teachings of Carey and Waitl would be combined by one of skill in the art at the time of the invention. In fact, the rejection of claim 24 amounts to no more than a hindsight reconstruction, as neither Carey nor Waitl discloses or suggests the claimed housings.

Claim 25, which depends from claim 24, covers housings for which “an angle between said reflector walls and the main emission direction is greater than an angle between said reflector surfaces and the main emission direction.” The Examiner alleges that “the combination of Carey et al. and Waitl et al. discloses an angle between the reflector walls 12 (figure 1 of Waitl et al.) and the main emission direction being greater than an angle between said reflector surfaces 30 (figure 1 of Minoru) and the main emission direction” (Action at page 10). Applicants traverse, for the following reasons.

First, the Examiner's reference to Minoru in the context of the present Office Action is improper. To the best of Applicants' knowledge, Minoru is not applied as a prior art reference in the present Action. Accordingly, the rejection of claim 25 should be withdrawn.

Second, as discussed above in connection with claim 24, the Examiner provides no indication of how or for what reason the teachings of Carey and Waitl would be combined by one of skill in the art at the time of the invention. Neither Carey nor Waitl discloses or suggests a housing where “an angle between said reflector walls and the main emission direction is greater than an angle between said reflector surfaces and the main emission direction” as required by claim 25. In fact, as for claim 24, the rejection of claim 25 amounts to no more than a hindsight reconstruction.

Therefore, for each of the foregoing reasons, Applicants respectfully request withdrawal of the rejection of claims 10-11 and 19-25 under 35 U.S.C. § 102(b).

Claims 13-14 and 59 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Carey in view of Han et al. (US Publication No. 2001/0054761, “Han”). Independent claim 13 has been amended to cover leadframes that include “a separately manufactured thermal connecting part disposed in [an] opening and fastened into [a] mount part

to form an electrical connection with the at least one external electrical connecting strip.” The amendment to claim 13 is supported by the original application at, for example, page 3, lines 1-19. As discussed above in connection with claims 1 and 17, Carey fails to disclose or suggest the leadframes covered by claim 13, at least because Carey does not disclose that heat-sinking slug 10 forms an electrical connection with an external electrical connector. To the contrary, Carey states that “metal leads on leadframe 12 ... are electrically and thermally isolated from the slug 10” (Carey, col. 2, lines 29-31, emphasis added). That is, Carey’s heat-sinking slug is explicitly not electrically connected to the leadframe. In contrast, claim 13 requires a thermal connecting part that “form[s] an electrical connection” with an electrical connecting strip.

Han fails to cure Carey’s deficiencies regarding claim 13. There is no reason to modify Carey’s disclosure according to Han or to any other reference to provide an electrical connection between slug 10 and leadframe 12. In fact, Carey teaches away from such an electrical connection, stating that “prior art packages lack thermal isolation between the electrical and thermal paths ... [and as] a result, the packaged die are subject to thermal stresses from the temperature cycling” (*id.*, col. 1, lines 30-33). Based on Carey’s disclosure, one of skill in the art at the time of the invention would therefore have found no reason to modify Carey’s LED package to provide a mount part that “form[s] an electrical connection” to an external electrical connecting strip, as required by claim 13.

Accordingly, Applicants submit that claim 13 is patentable over both Carey and Han, and respectfully request withdrawal of the Examiner’s rejection of claim 13 under 35 U.S.C. § 103(a). Claims 14 and 59 each depend from claim 13, and each is therefore patentable for at least the same reasons. Therefore, withdrawal of the rejection of claims 14 and 59 is also requested.

Claims 39-40 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Carey in view of Hochstein (U.S. Patent No. 6,517,218, “Hochstein”). Without addressing the merits of the Examiner’s proposed combination of Carey and Hochstein, Applicants note that claims 39 and 40 depend from claim 1. As discussed above, claim 1 is patentable over Carey at least because Carey fails to disclose or suggest leadframes that include “a separately

manufactured thermal connecting part disposed in [an] opening and fastened into [a] mount part to form an electrical connection with the at least one external electrical connecting strip" as required by claim 1. Furthermore, there would have been no reason to modify the teachings of Carey according to Hochstein or to another reference to provide an electrical connection between a thermal connecting part and a mount part, at least because Carey explicitly teaches away from providing such an electrical connection.

Therefore, Applicants submit that claim 1 is patentable over both Carey and Hochstein. Claims 39 and 40, which depend from claim 1, are patentable over both Carey and Hochstein for at least the same reasons as claim 1. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 39 and 40 under 35 U.S.C. § 103(a).

Claims 41-42 and 47-48 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Carey in view of Matsumoto et al. (JP 402187058, "Matsumoto"). Without addressing the merits of the Examiner's proposed combination of Carey and Matsumoto, Applicants note that claims 41-42 and 47-48 depend from claim 1. As discussed above, claim 1 is patentable over Carey at least because Carey fails to disclose or suggest leadframes that include "a separately manufactured thermal connecting part disposed in [an] opening and fastened into [a] mount part to form an electrical connection with the at least one external electrical connecting strip" as required by claim 1. Furthermore, there would have been no reason to modify the teachings of Carey according to Matsumoto or to another reference to provide an electrical connection between a thermal connecting part and a mount part, at least because Carey explicitly teaches away from providing such an electrical connection.

Therefore, Applicants submit that claim 1 is patentable over both Carey and Matsumoto. Claims 41-42 and 47-48, which depend from claim 1, are patentable over both Carey and Matsumoto for at least the same reasons as claim 1. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 41-42 and 47-48 under 35 U.S.C. § 103(a).

Claim 49 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Carey in view of Mahulikar et al. (U.S. Patent No. 5,608,267, "Mahulikar"). Without addressing the merits of the Examiner's proposed combination of Carey and Mahulikar, Applicants note that

claim 49 depends from claim 1. As discussed above, claim 1 is patentable over Carey at least because Carey fails to disclose or suggest leadframes that include “a separately manufactured thermal connecting part disposed in [an] opening and fastened into [a] mount part to form an electrical connection with the at least one external electrical connecting strip” as required by claim 1. Furthermore, there would have been no reason to modify the teachings of Carey according to Mahulikar or to another reference to provide an electrical connection between a thermal connecting part and a mount part, at least because Carey explicitly teaches away from providing such an electrical connection.

Therefore, Applicants submit that claim 1 is patentable over both Carey and Mahulikar. Claim 49, which depends from claim 1, is patentable over both Carey and Mahulikar for at least the same reasons as claim 1. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 49 under 35 U.S.C. § 103(a).

Claim 54 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Carey in view of Huang (U.S. Patent No. 6,664,649, “Huang”). Without addressing the merits of the Examiner’s proposed combination of Carey and Huang, Applicants note that claim 54 depends from claim 17. As discussed above, claim 17 is patentable over Carey at least because Carey fails to disclose or suggest housings that include “a separately manufactured thermal connecting part disposed in [an] opening and fastened into [a] mount part to form an electrical connection with the at least one external electrical connecting strip” as required by claim 17. Furthermore, there would have been no reason to modify the teachings of Carey according to Huang or to another reference to provide an electrical connection between a thermal connecting part and a mount part, at least because Carey explicitly teaches away from providing such an electrical connection.

Therefore, Applicants submit that claim 17 is patentable over both Carey and Huang. Claim 54, which depends from claim 17, is patentable over both Carey and Huang for at least the same reasons as claim 17. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 54 under 35 U.S.C. § 103(a).

Applicants believe that all pending claims are patentable, and respectfully request a Notice of Allowance.

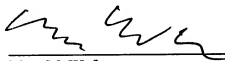
Canceled claims, if any, have been canceled without prejudice or disclaimer. Any circumstance in which Applicants have: (a) addressed certain comments of the Examiner does not mean that Applicants concede other comments of the Examiner; (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for the patentability of those claims and other claims; or (c) amended or canceled a claim does not mean that Applicants concede any of the Examiner's positions with respect to that claim or other claims.

No fees are believed to be due. Please apply any charges or credits to deposit account 06-1050, referencing Attorney Docket No. 12406-127001.

Respectfully submitted,

Date: _____

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